REMARKS

By the *Office Action* of 27 March 2003, Claims 1-7 are pending in the Application, and all rejected. By the present *Response and Amendment*, Claims 1-7 are cancelled, and new Claims 8-27 presented.

Applicant presents several distinguishing features between the present method Claims and the cited references and in so doing, believes the rejection of the Claims in view of the cited art is overcome.

1. New Counsel

Applicant has retained new counsel for prosecution of this Application. New counsel has reviewed the prosecution history of the Application, noting the arguments made, and specifically noting that the Examiner has rejected the apparatus Claims while stating that the methodology arguments presented by previous counsel (attempting to distinguish the Claims from the cited references) were not limitations present in the ***structural*** Claims, and thus moot (9 February 2001 *Office Action*, Page 5).

Applicant herein clarifies the invention of the Application by presenting new ***method*** Claims that are believed distinguishable from the cited references by reciting particular methodology that is neither anticipated nor made obvious by the cited references.

2. The Present Invention

In essence, the present invention provides automation to cooking systems so food items are consistently of high quality even if an employee cooking the food is inattentive to the constantly changing cooking parameters. The Applicant notes several disadvantages to conventional fry cooking systems, and presents novel and non-obvious solutions to overcome these deficiencies.

A. New Oil/Old Oil Temperature Compensation

A first problem with prior art cooking systems identified by the Applicant is that conventional cooking appliances do not compensate the cooking temperatures of the cooking medium, mainly oil, over the life span of the oil. Cooking oil is used through many cycles. For example, if it takes ten minutes to produce a fully cooked food product in fresh oil, it is understandable that a similar food product that is cooked in oil that has been through hundreds of cooking cycles may need to be cooked at a different temperature than that used in fresh oil to get

the same look. Some cooking variable (*i.e.* temperature or length of cooking cycle) must change to get the same looking and tasting food product no matter if the oil is fresh, or is quite old and full of particulate matter and other things.

For example, fresh cooking oil used to cook a food item may present the food item in a lighter color than will old cooking oil that will provide the food item with the consumer's expectation of a deep color. As noted in the Application:

> Cooking oil has an acceptable life span. At the beginning of that life span, chicken cooked in "new oil" typically adopts a pale color. Thus, although such chicken may be fully cooked, it lacks the aesthetically pleasing "golden-brown" color. Alternatively, chicken cooked in oil that is nearing the end of its life span is often times too dark. Once again, while such chicken is fully cooked, it is not "golden-brown." *Specification, Page 32, Lines 20 – 26.*

Of all the cooking parameters that can be altered over the course of the cooking oil's life, the Applicant noted that compensating for the ***temperature*** of the fresher oil (it must be higher than the temperature of older oil) must be used to maintain uniformity of food product color throughout the oil's useful life.

Assuming that the fry cook has many things on his/her mind, the fry cook likely will not adjust the temperature of the oil depending on the freshness of the oil. Conventional cooking processes assume a set cooking temperature for a particular food product, for a set amount of time. No compensation of the cooking temperature is made for the relative freshness or staleness of the oil. The present invention provides just such a compensation.

> To address these issues, the present invention contemplates a "new oil temperature adjustment" and "new oil temperature adjustment cycles." The new oil temperature adjustment provides how much the cooking oil temperature will be increased when new oil is installed into the cooking well 35. The method contemplates decreasing the new oil adjustment over a specified number of cook cycles. *Specification, Page 32, Line 27 – Page 33, Line 4.*

New Claims 8-14 recite the specific methodology of compensating the cooking temperature of each cooking cycle in view of the freshness/staleness of the cooking oil by keeping track of the cooking cycles, thus knowing how old the cooking oil is, and by compensating the cooking temperature of each cycle by an amount that will preferably produce a uniform looking food product.

B. Oil Stratification Compensation

The Applicant noticed another problem with prior art cooking systems - that they did not compensate cooking temperatures of the cooking medium, mainly oil, for oil temperature stratification. As noted in the Application:

> One limitation of prior art fryers is oil temperature stratification. The inventor has discovered that this condition results in different areas of the cooking well having oil heated to differing temperature. Oil temperature stratification occurs gradually over time due to idling or rapidly after an initial heat-up of the fryer. A simplified diagrammatic example of oil temperature stratification is shown in Fig. 1, which shows a cooking well with 3 levels of stratification. In this example, the temperature sensor is placed near the top of the cooking well. The desired cooking temperature is 325°F and, as shown, the temperature sensor indicates that the cooking oil temperature is 325°F. However, due to oil temperature stratification, the oil temperature in the middle strata is only 300°F (for example) and the temperature in the bottom strata is only 275°F (for example). *Specification, Page 5, Lines 13 – 25.*

It is apparent that such oil temperature stratification, if not compensated for, will lead to undercooked or overcooked product, as the temperature of the cooking oil around the food product will likely be quite different from the sensed temperature, where the temperature probe might be located in a temperature stratification that is several degrees away from the oil around the food product. As disclosed:

> Thus, while the sensed temperature is 325°F, the average temperature in the cooking well is 300°F and the temperature of the oil at the bottom of the well is significantly lower than the sensed temperature at the top of the well. Even if the oil in the cooking well was thoroughly stirred, the resultant temperature of the oil immediately after stirring would be approximately 300°F, not the desired cooking temperature of 325°F. It is to be understood that the foregoing is exemplary. The temperatures selected are for ease of description and demonstration. The problems associated with oil temperature stratification include inadvertently undercooking the food product and failing to account for a stirring of the oil, whether by manually stirring the oil or as a result of agitation due to cooking. Those of ordinary skill will appreciate that this temperature variation can be significant in terms of the cooked product. Photograph A shows chicken products cooked to varying internal temperatures, ranging from 285°F to 345°F in 15°F intervals. As shown, the chicken cooked to 285°F is significantly lighter than the chicken cooked to 315°F. Further, the chicken cooked to 345°F is significantly darker than that cooked to 315°F. *Specification, Page 5, Line 25 – Page 6, Line 14.*

The stratification concern is echoed later in the disclosure:

> Yet another concern discovered by the applicant is that the oil temperature within the cook well is not consistent. Instead, the oil temperature in prior art fryers often tends to stratify, such that the greatest or highest oil temperature is food at the top of the well and the lowest temperature is found at the bottom of the well. As a result, the food product being cooked at the top of the well is being cooked in a hotter oil than that food product at the bottom of the cook well. Thus, even within a single batch, the same product may be cooked with different results due to oil temperature stratification. Such stratification is inherent to the equipment and has gone unaddressed in the prior art. *Specification, Page 8, Line 23 – Page 9, Line 4.*

New Claims 15-20 recite the specific methodology of compensating the cooking temperature of each cooking cycle in view of stratification.

C. Sensed Oil Temperature Drop Compensation

Yet another problem with operator inattentiveness is that the cooking operator may drop a food item into the cooking medium, but not start the cooking cycle timer. Thus, the food item may cook well beyond the true cooking time because the operator neglected to push the start button to time the cooking process. "...[T]he operator may be so busy with other tasks that the timer may not be initiated consistently relative to the product being laded into the heated oil". *Specification, Page 26, Lines 10-12.*

The present invention compensates for this problem.

> A fourth compensation is for a variation in operating procedure. This compensation bases the start of a cook cycle on a sensed oil temperature drop. Thus, rather than utilizing prior art methods relying on an operator's initiation of the cook cycle by pressing a button or the like, this compensation relies on a change in the temperature of the oil within a predetermined time range enveloping the cook cycle activation (i.e., pressing the "start" button). *Specification, Page 14, Lines 10-16.*

New Claims 21-23 recite the specific methodology of compensating the cooking cycle time in view of potential operator inattentiveness.

> The present invention compensates for such variations in cooking procedure by ***basing the cook cycle start on the sensing of a programmable oil temperature drop rate***. This operation is started when an operation of menu button 44-49 is pressed to identify the product that has been loaded. The computer looks ***backward*** in time relative to a menu button 44-49 being pressed for a predetermined amount of time to determine if a product has been dropped by checking for a sufficient temperature drop rate. If no drop

> is detected, the controller 40 (computer) ***monitors the sensed temperature for a predetermined time after depression [that is, looks forward in time]*** of button 44-49 for a product drop. If no drop is detected before or after button 44-49 is pressed, the controller 40 (computer) assigns a predetermined start time relative to the actual time button 44-49 was pressed. A preferred assigned start time may be determined empirically but is to be selected so as to insure that the food is cooked thoroughly. ***This method is used instead of merely initiating the cook cycle upon an operator's pressing of a timer button because this prior art method has been found to be highly variable in field observations.*** Thus, the present invention includes a drop trigger setting that specifies the temperature rate of rise value that is recognized as the drop point. A negative value indicates a drop in temperature. *Specification, Page 26, Lines 13 – Page 27, Line 4 (emphases added).*

D. Non-Linear Compensation of the Duration of the Cooking Cycle

Yet another problem identified is differences in the sensed cooking temperature and the temperature reference point, which, if unaddressed, will mean the length of the cook cycle will be wrong. As noted:

> A fifth compensation is used to compress or augment the time variable during a cook cycle to counteract sensed temperature differences as opposed to a temperature reference point. This compensation utilizes a unit of time and, for each unit compares the sensed actual oil temperature with a reference temperature. Based on that comparison, the preferred embodiment utilizes a non-linear compensation algorithm to calculate a compensation value by a defined or programmable exponential equation. According to this value, the invention contemplates that the cook time element will be augmented or compressed accordingly. *Specification, Page 14, Lines 17-26.*

New Claims 24-27 recite the specific methodology of compensating the length of the cooking cycle time in view of these temperature differences.

3. Claims 8-14

As to the embodiment of the present invention - New Oil/Old Oil Temperature Compensation - Claim 1 (now cancelled) recited a cooking appliance that comprised a controller to adjust the temperature of new cooking medium higher than old cooking medium. The Examiner repeatedly rejected Claim 1 as not novel over Vasseloff et al.

New counsel recasts this embodiment of the invention in Claims 8-14, presenting method Claims that specifically recite the novel and non-obvious features of the present invention. It is respectfully submitted that Claims 8-14 are novel over Vasseloff et al.

Claim 8 recites that the cooking medium be heated to a temperature $\mathbf{T_c}$ that is dependent on the number of cooking cycles the cooking medium has been through, and that $\mathbf{T_c}$ be greater than $\mathbf{T_{c+1}}$, that is, that the cooking temperature of a relatively fresh batch of cooking medium is higher than an older batch of cooking medium. After $\boldsymbol{n}$ cycles of the cooking oil, there may need to be no more compensation for temperature increases, and $\mathbf{T_c}$ may be equal to $\mathbf{T_{c+1}}$, after such $\boldsymbol{n}$th cycle.

Claims 11-13 specifically recite the preferred cooking compensation disclosed in the *Specification, Page 13, Lines 15-25*:

> To compensate for the effect of replacing unsuitable or "old oil" in the cooking well, sensed oil temperature is adjusted by an amount prorated over a select number of cooking cycles. The prorated adjustment is added to a reference temperature to determine an appropriate cooking time expansion or contraction period for use in the cook time compensation described hereinbelow. This "new oil" compensation may have multiple levels. For example, the compensation may include an oil temperature gradient from 10ºF to 3ºF over 30 cook cycles; a decreasing oil temperature gradient from 3ºF to 2ºF over the next 70 cook cycles; and a decreasing oil temperature gradient from 2ºF to 0ºF over the next 900 cook cycles.

Claim 14 specifically recites the novel embodiment of compensating for cooking temperatures disclosed in the *Specification, Page 33, Lines 6-12*:

> Thus, for example, the best mode of accomplishing this function as presently known to the inventor, is to increase the cooking oil temperature by 15ºF for the first cycle or new oil and ramp the offset down to 4º F by the 29th cook cycle. A second stage then ramps the offset from 3ºF to 2ºF over cook cycles 30 to 99. A third stage then ramps the offset temperature from 2ºF to 0ºF over cook cycles 100-1000.

4. Claims 15-20

As to the embodiment of the present invention – Oil Stratification - Claim 2 (now cancelled) recited a cooking appliance that comprised a controller to adjust the temperature of cooking medium in view of oil stratification. The Examiner repeatedly rejected Claim 2 as not novel over <u>Vasseloff et al.</u>

New counsel recasts this embodiment of the invention in Claims 15-20, presenting method Claims that specifically recite the novel and non-obvious features of the present invention. It is respectfully submitted that Claims 15-20 are novel over <u>Vasseloff et al.</u>

Claims 15-20 specifically recite the novel embodiment of compensating for cooking temperature stratification disclosed in the *Specification, Page 25, Lines 15-28*:

> A preferred ramp has been empirically determined to be raising the oil temperature 10°F per 30 minutes. Thus, in 30 minutes the oil temperature would have been raised to a maximum heat-up adjustment temperature of 10°F. In this example, if no other offsets were in action and the normal set temperature was 320°F, the sensed oil temperature would be 330°F. Once the adjustment temperature has been reached, the computer regulates the oil temperature to maintain this offset from the desired cooking temperature. Those of ordinary skill in the art will appreciate that the ramp rate may vary and the adjustment temperature may also vary depending on the particular circumstances. It is to be further understood that this prorated offset is reset to 0 (and started again) when either a stir of the oil is detected (as explained) or by the initiation of a cook cycle (also explained below).

5. Claims 21-23

As to the embodiment of the present invention – Sensed Oil Temperature Drop Compensation - Claim 3 (now cancelled) recited a cooking appliance that comprised a controller to compensate the start of the cooking cycle until a drop in temperature of the cooking medium was detected. The Examiner repeatedly rejected Claim 3 as not novel over Vasseloff et al.

New counsel recasts this embodiment of the invention in Claims 21-23, presenting method Claims that specifically recite the novel and non-obvious features of the present invention. It is respectfully submitted that Claims 21-23 are novel over Vasseloff et al.

Claims 21-23 find basis in the Application as disclosed at *Page 27, Line 5 – Page 28, Line 6*:

> Described by way of the instant example of the invention, the operator may load chicken fillets into the carrier 38. Once that load has been dropped into the cooking oil and the fryer lid closed and secured, the operator depresses function button 44, which activates the fillet cooking program. The computer will then look forward and backward of that activation time. A preferred time period is to look forward and backward for a period of time, up to 60 seconds each, for example. Thus, within a drop window of 120 seconds, for example, the computer looks to see if the sensed oil temperature in the cooking well has dropped a predetermined value in a predetermined period of time. For example, a preferred predetermined temperature drop rate is 0.2°F per second. A preferred time window in which said temperature drop is to occur is 45 seconds. If the computer identifies a sufficient temperature drop during the defined drop window, the computer of the controller 40 will initiate the cook cycle as of that drop detect point rather than on the time when the operator depressed the timer

button. If a sufficient drop is not detected, the computer of the controller 40 employs an empirically derived default time that is stored as a variable in memory.

The foregoing drop detection method is thus initiated when the operator presses a start or timer button. This methodology does not start the cook cycle merely upon pressing a function or menu button 44-49 or upon pressing a timer. Further, when the drop detect function is initiated, the computer will review data maintained in the Cook Data record to see if a drop in oil temperature has just recently occurred. If so, and if the temperature drop meets the drop trigger criteria set forth hereinabove, the drop detection function analyzes the time difference between the drop detect point and the time the start button was actually pressed. The calculated time difference is then used to adjust and anchor the cook cycle to the time the food was actually loaded rather than the timer button was pressed.

6. Claims 24-27

As to the embodiment of the present invention – Non-Linear Compensation of the Duration of the Cooking Cycle - Claims 4-6 (now cancelled) recited a cooking appliance that comprised a controller to compensate the length of the cooking cycle with non-linear compensation. The Examiner repeatedly rejected Claims 4-6 as not novel over Vasseloff et al. and/or obvious in view of Maher Jr.

New counsel recasts this embodiment of the invention in Claims 24-27, presenting method Claims that specifically recite the novel and non-obvious features of the present invention. It is respectfully submitted that Claims 24-27 are novel and non-obvious over Vasseloff et al. and Maher Jr.

7. Fees

This *Response and Amendment* is being filed within six months of the *Office Action*, and more specifically within five months, thus a two month extension of time fee is believed due in an amount of $410.00.

No Claim fees are believed due, as the application was filed with seven (7) Claims, all of which were independent, and with the entrance of this *Response and Amendment,* the Application has twenty (20) Claims, five (5) of which are independent. Thus, it is believed no additional Claim fees are due.

Nonetheless, should any further fees be due, authorization to charge deposit account No. 20-1507 is hereby expressly given.

CONCLUSION

By the present *Response and Amendment*, the Application has been in placed in full condition for allowance. Accordingly, Applicant respectfully requests early and favorable action. Should the Examiner have any further questions or reservations, the Examiner is invited to telephone the undersigned Attorney at 404.885.2773.

Respectfully submitted,

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21 August 2003
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